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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

**REGION 5**

**230 SOUTH DEARBORN ST.  
CHICAGO, ILLINOIS 60604**

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SEP 07 1988

REPLY TO THE ATTENTION OF:  
5HS-11

Frank D. Hale  
Regional Office Manager  
O'Brien & Gere Engineers, Inc.  
440 Viking Drive, Suite 250  
Virginia Beach, Virginia 23452

Dear Mr. Hale:

This letter was prepared in response to your letter of August 18, 1988, regarding the assumptions and methodology to be used in the preparation of the revised risk assessment for the National Lead Inc./Taracorp Inc., Remedial Investigation (RI). The "Acceptable Daily Intake" (ADI) approach presented in the letter, for use in developing an acceptable soil concentration for inorganic elements, is fundamentally flawed and cannot be used in assessing the risks associated with exposures to lead or the other inorganic elements of concern (arsenic, cadmium, chromium, and nickel). The specific comments follow.

° The Illinois Department of Public Health Blood Lead Survey Approach:  
The Illinois Department of Public Health (IDPH) cross-sectional blood lead (Pb-B) survey of 1982 is inadequate for use in conducting a site-specific risk assessment, for the reasons detailed in the both U.S. EPA's and IEPA's written response to the draft RI, and discussed again at length at two recent formal meetings (May and August 1988).

One of the Agency's objections to the IDPH study, the timing of the Pb-B survey, lead you to inquire about the seasonal variation of Pb-B. In response, one can say that generally the Pb-B of a population tends to be highest in the late summer or fall. However, there is considerable variation among communities, depending on the local climate and terrain. There are several published studies which would allow one to estimate the magnitude of this relationship in a population. The rate of decline from the peak Pb-B ranges from 2.3 - 8.8 percent/month. A reasonable estimate is approximately 5 percent/month. Thus, one could estimate that the mean Pb-B level in the Granite City population would have been 15-20 percent higher had the survey been conducted in the late summer or fall, instead of in November and December. Nonetheless, the other deficiencies in the IDPH Pb-B survey preclude its use for a site-specific risk assessment.

° The Acceptable Daily Intake Approach: As discussed at the August 1988 meeting, the Acceptable Intake for Chronic oral exposure (AIC) value in the Superfund Public Health Evaluation Manual (EPA/540/1-86/060, October 1986) was withdrawn by the Agency because of concerns regarding its

adequacy. Consequently, the proposal to use the former AIC value in the derivation of an 'adjusted' AIC is groundless. The inadequacy of the letter's ADI approach based on this 'adjusted' AIC is demonstrated further by several other major errors, including its mixing of exposure and absorbed dose, its use of the absorption factor of 0.3, and the fact that the Superfund program does not support the use of risk apportionment in performing site-specific risk assessments.

In the absence of a toxicity value for lead, the Agency has adopted the recommendation of the Centers for Disease Control (Preventing Lead Poisoning in Children, January 1985) that:

In general, lead in soil and dust appears to be responsible for blood lead levels in children increasing above background levels when the concentration in the soil or dust exceeds 500-1,000 ppm.

Prudent public health policy supports the use of this low-level range for lead given that lead induces a variety of adverse health effects, including neurobehavioral damage, reduced growth, and hearing impairment in children, and elevated blood pressure with the corollary increased risk of morbidity and mortality in adults. There are no clearly discernible thresholds for some of these effects.

The methodology developed in the Superfund Public Health Evaluation Manual (SPHEM) must be followed for performing the risk assessment for the other inorganic compounds (IOCs) of concern. The cancer potency factor ( $q_1^*$ ) and Reference Dose for oral exposure ( $RfD_o$ ) for each of these IOCs should be obtained from the U.S. EPA Integrated Risk Information System (IRIS). In the event that a particular  $q_1^*$  or  $RfD_o$  is not currently available on IRIS, then the missing value should be obtained from the most recent update of the SPHEM toxicity values.

The exposure assessment currently consists of an examination of only the soil ingestion pathway. Indirect exposure through homegrown vegetables should also be evaluated, as this pathway could easily contribute several ug/d to an individual's daily intake of each inorganic element of concern.

The soil ingestion rates presented in your letter for use in the exposure assessment include values obtained from three different sources, U.S. EPA (1987), LaGoy (1987), and Calabrese et al. (1987). While the values from U.S. EPA are used for children's intake (100-1,000 mg soil/d), the adult soil ingestion rates of LaGoy (50 mg/d) are passed over in favor of the assumptions of Calabrese et al. (10 mg/d). Given the dearth of empirical data regarding adult soil ingestion behavior, the higher soil ingestion rate of LaGoy should be used for the adult exposure assessment.

Finally, the purpose of this process--the determination of a health-based cleanup target level for the inorganic contaminants in the soil, is clearly complicated by the absence of a  $q_1^*$  or  $RfD_o$  for lead. Consequently, the results of a risk assessment for the IOCs (aside from lead) based on the average and maximum values found off-site, will have to be compared with the 500-1,000 ppm CDC criterion for lead. It is not yet known whether lead or the risk associated with another inorganic element will drive the soil cleanup level overall, or whether lead may be the critical IOC at one

location and move other IOC at another. As we discussed in August, the final decision on the soil cleanup levels is a risk management decision which factors in an evaluation of a variety of factors. The results of the risk assessment is only one of the factors.

If you have any additional questions, please give me a call at (312) 886-4742.

Sincerely,

*Brad Bradley*  
Brad W. Bradley  
Project Coordinator  
IL/IN Section

cc: David Dolan, U.S. EPA  
Ken Miller, IEPA  
Connie Sullinger, IEPA